

Effect of Random Drug Screening on Fatal Commercial Truck Accident Rates

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Abstract

The objective of this project was to analyze the effect that random drug screening has had on the accident rate among commercial truck drivers. Reliable denominator data (active truck drivers) was not available so a search was made for a suitable proxy. Data on the fatality rate per 100 million vehicle miles traveled was analyzed. This data showed a downward trend over the seven years prior to initiation of drug screening. Regression analysis from 1984 to 1989 revealed a statistically significant decrease in the fatal accident rate for 2 years after drug screening was initiated. Within 6 years the rate had increased to a level predicted by the regression line. This study was unable to establish a causal association between the initiation of random drug screening and decreasing fatal truck accident rates.

Keywords

Random drug screen, truck driver, accident rate, commercial motor vehicle

Introduction

Controlled Substance Testing regulations were published by the Federal Highway Administration in 1988.¹ Effective December 21, 1989 these rules required commercial motor carriers engaged in interstate commerce employing 50 or more truck drivers to begin random urine drug screens. On December 21, 1990 all other interstate carriers became subject to the same requirements.

The random drug testing regulations are governed by 49 CFR part 40. These regulations apply to employers of interstate commercial truck drivers and owner operators. Drivers to be tested are selected randomly by the employer with the odds of being selected equal for every covered driver on every collection day. The frequency and interval of collections are at the discretion of the employer as long as 50% of the covered drivers are tested annually. Collection sites are designated by the employer and must possess the necessary personnel, facilities, and material to collect the specimens in accordance with protocols established in the rule. Specimens must be analyzed by a federally certified laboratory.

The authors undertook a literature review in search of papers that have analyzed the effect this regulation has had on the rate of commercial motor vehicle crashes.

We performed a search of the peer reviewed as well as government literature but could find no papers that have addressed this question. It is important to understand what impact this regulatory burden has had on achieving improved commercial motor vehicle safety.

Once it was determined that this question had not been addressed in the published literature we began a search for the data needed to undertake this analysis. We discovered that there was good numerator data on the casualty side but very poor denominator data on the numbers of active truck drivers. Further research revealed data on fatal accidents per 100 million vehicle miles traveled.² This is the data the government uses as a proxy for accident rates.

The data showed that the fatal accident rate has been on a downward trend during the years prior to and since the inception of drug screening

Methods

This paper analyzes data on fatal truck crashes. This analysis was initially undertaken by searching for incidence rates on crashes among commercial motor vehicle drivers. After searching the federal government databases and publications it became apparent that this data might not exist in a form that is accurate and reliable. A representative of the Analysis Division at the Federal Highway Administration indicated that accident rates for truck drivers are not available. There is good numerator data on the number of fatal large truck crashes each year, however, denominator data on the number of active truck drivers is not known with a sufficient degree of accuracy. The government uses rates of truck crashes per 100 million vehicle miles traveled (VMT) as a proxy for crash rates among truck drivers. This data is contained in the Fatality Analysis Reporting System database (FARS) and is summarized in Traffic Safety Facts 1997.^{3,2}

The General Estimates System (GES) is a database that contains information on injury and property-damage-only crashes.⁴ This data goes back to 1988 which does not provide sufficient pre-drug-screening data to allow meaningful analysis.

The change in the Fatality Rate per 100 million VMT was modeled by linear regression over the years 1984 to 1989. (Fig. 1) In addition, 95% prediction limits

were computed (95% confidence intervals for predicting an individual value). These were extrapolated over the following 8 years. Values that fell outside these limits were considered significantly different from the trend exhibited over the years 1984-1989.

Results

The data on crash rates per 100 million vehicle miles traveled is taken from Traffic Safety Facts 1997.² It is abstracted from the FARS database which is maintained by the National Highway Traffic Safety Administration.³ (Table 1) A large truck is defined by FARS as weighing over 10,000 pounds gross vehicle weight, including single unit trucks and truck tractors.⁵

Discussion

We conclude from this analysis that the introduction of random urine drug screening among commercial truck drivers was associated with a statistically significant decrease in fatal truck crashes for the 2 years following widespread application of the regulations.

By December 21, 1990 all interstate commercial motor vehicle carriers were subject to the random drug testing requirements. The first full calendar year that all interstate large truck drivers were subject to random testing under the regulations was 1991. The data points for 1991 and 1992 fall outside the confidence limits of the regression line. By 1993 the fatal crash rate was back within the confidence limits of the regression line and the data points for 1996 and 1997 fall on the regression line. (Fig. 1) The authors could not find suitable data to use as a control.

According to an analyst with the Federal Highway Administration, the FARS database while considered reliable, is subject to error. Trucks can be miscoded thus introducing classification bias into the data. The database includes all trucks, not just commercial trucks. As a result, government and private non-commercial trucks are included. These vehicles are not subject to random urine drug screening regulations and may skew the data. Also, the VMT data has been subject to reporting error and there have been variations from state-to-state and year-to-year. However, over the years as data collection and review has become more consistent the Federal government and industry have come to use this data as an important indicator of commercial truck safety. We believe that the trends established by this data are useful in spite of the potential sources of bias.

Fatal crashes are only part of the commercial truck safety picture. The lack of pre random drug testing data on injury and property-damage-only crashes together with a lack of suitable control data limited our ability to make supportable conclusions.

A representative of the Federal Motor Carrier Safety Administration within the Department of Transportation was consulted to determine whether other commercial motor vehicle safety regulations might have been effective over time in contributing to the observed accident rate decrease. The Commercial Motor Vehicle Safety Act of 1986 was the enabling legislation that required covered drivers to obtain a Commercial Drivers License (CDL). These regulations (49 CFR part 383) required drivers to obtain a CDL by April 1, 1992. It is unlikely that this requirement had any impact on the accident rate for 1991. It is possible that the 1992 rate was affected to a limited degree. Nineteen ninety-three would have been the first full year affected by the CDL requirement and by then the accident rate decrease was no longer statistically significant.

Our analysis does not establish causation. We cannot be certain that the initiation of random drug screening of truck drivers was responsible for the temporary

reduction of fatal truck crashes. It is likely that drug screening was responsible for a portion of the observed decrease.

Random drug screening may have produced benefits early on that do not appear to be sustained in later years. Can the costs and regulatory burden of randomly drug screening commercial truck drivers continue to be justified given this data's apparent lack of continued benefit to public safety? This paper raises public policy questions that need to be explored further. Hopefully this analysis will stimulate debate and continued study of this issue.

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Fig. 1. Linear regression analysis of data from 1984 to 1989 is extrapolated over the subsequent 8 years. 95% confidence intervals are shown.

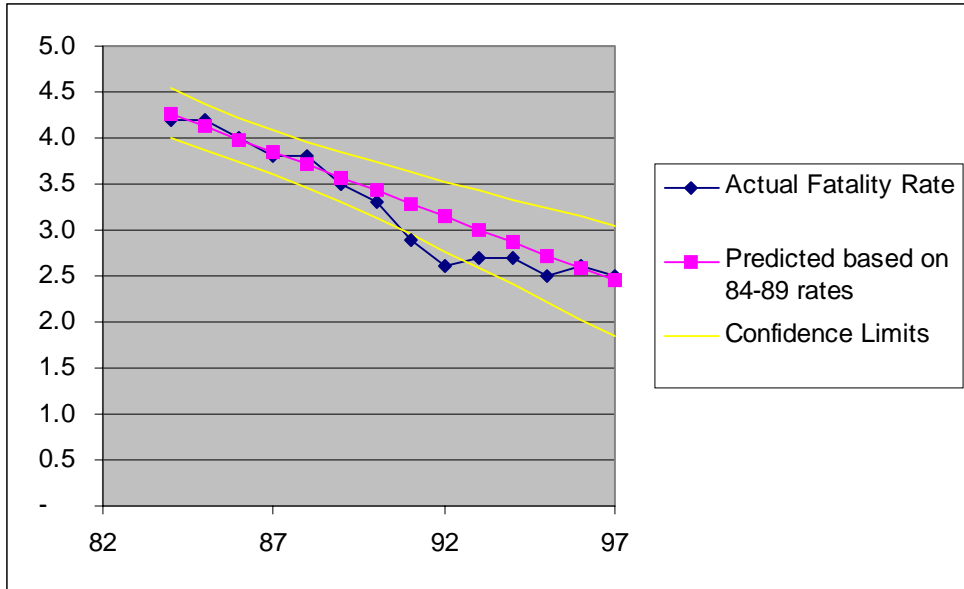


Table 1
Large truck fatal accident
rate*

Year	Accident Rate
1984	4.2
1985	4.2
1986	4.0
1987	3.8
1988	3.8
1989	3.5
1990	3.3
1991	2.9
1992	2.6
1993	2.7
1994	2.7
1995	2.5
1996	2.6
1997	2.5

*per 100 million vehicle miles traveled (VMT)